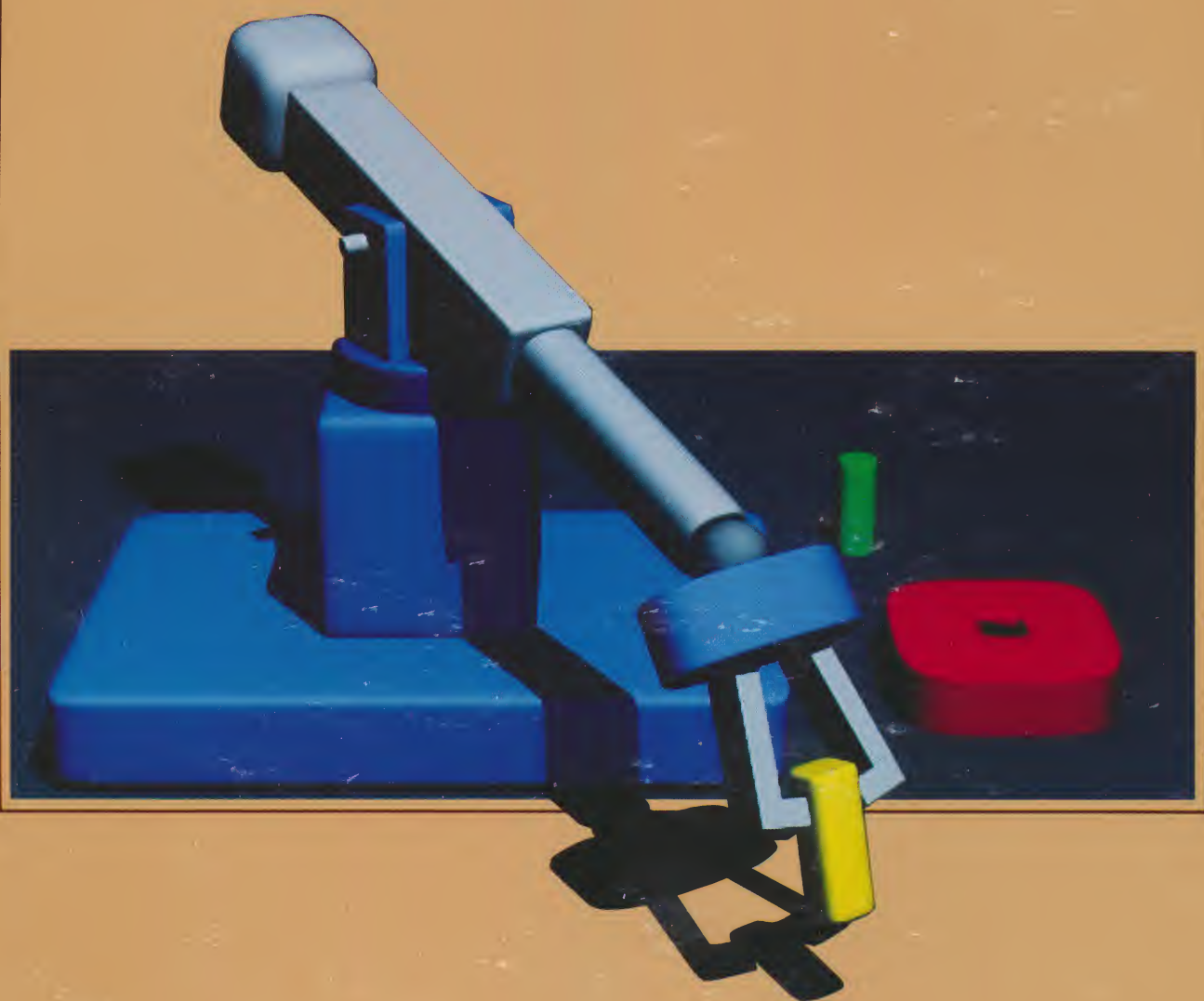


Raster Technologies



A New Company; An Emerging Industry

Raster Technologies is a new company in an industry just now emerging from first-generation, application-specific graphic display products.

These first generation products were regarded as "problem-solving" devices. But as many users have found, they can create new problems—in growth flexibility, user friendliness and price/performance—as their operating environment changes.

Raster Technologies was founded by two research staff members at the Center for Interactive Computer Graphics of Rensselaer Polytechnic Institute (RPI) in New York State. The RPI graphics center is a world-renowned facility with more than 50 graphics terminals and peripherals, four networked computer systems and 2.5 billion bytes of on-line storage.

Drawing from their hands-on experience with state-of-the-art equipment, the founders of Raster Technologies designed a computer graphics system that would be truly user-responsive, in terms of operational simplicity and future growth flexibility, and that would provide outright price/performance superiority over available products.

The result is a series of Raster Technologies products clearly superior to current systems. Whatever the need in CAD/CAM or computer imaging applications, a look at Raster Technologies' graphics systems will show why the differences are obvious, and the choice is clear.

Robot arm simulation
Center for Interactive Computer Graphics
Rensselaer Polytechnic Institute



Contact: Louis Doctor
Raster Technologies, Inc.
(518) 274-8031

FOR IMMEDIATE RELEASE
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From: Jim Buchanan
The Strayton Corporation
55 William Street
Wellesley, Mass. 02181
(617) 237-3220

NEW COMPUTER GRAPHICS COMPANY FORMED

TROY, N.Y., August 4 -- Raster Technologies, Inc., a new company in the computer graphics industry, has been formed to manufacture and market high-performance graphics-display products for computer-aided design and manufacturing (CAD/CAM) and computer imaging applications.

The company's first product, announced at the ACM SIGGRAPH '81 Computer Graphics Exposition and Conference in Dallas, is a highly cost-effective raster-scan color graphics controller designed around 64K RAM memory components.

The Model One controller features software-selectable dual-mode operation, with either a 512 x 512 or 1K x 1K image array, depending on what the application calls for. The Model One can be installed in an existing graphics system, or it can be supplied with a variety of popular display monitors and interactive devices. Other features include ease of installation and user training/operation, FORTRAN-callable graphics commands, and upward compatibility with future Raster Technologies products.

Beginning at RPI

Formed in September, 1980, and incorporated in March, 1981, Raster Technologies began as a "spin-off" from the Center for Interactive Computer Graphics at Rensselaer Polytechnic Institute (RPI). The RPI graphics center is an internationally recognized leader in computer-graphics research: resources at the graphics center include four networked computer systems, 2.5 billion bytes of on-line storage, and more than 50 computer graphics terminals and peripherals.

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"Experience in the graphics center and, later, in the graphics industry, convinced us that most current systems were limited in terms of application flexibility, user responsiveness and architectural capabilities," says Louis Doctor, a co-founder of Raster Technologies, along with John Torborg, also of RPI.

"We realized that current vendors are restricted by early design architectures, whereas we had the freedom to orient our architecture around the 64K RAM," he says. "This gives us a distinct design advantage, since 64K RAMs require a very different architecture than the 16K RAMs now used by our competitors.

"With greater memory capacity, we were able to give comprehensive machine resources to solving the problems of 'next-generation' graphics users, at prices that are extremely competitive and stable."

Raster-Scanning: Cost-Effective Color Technology

Of the four technologies employed in graphics display systems -- direct-view storage, refresh vector, plasma panel and raster-scan -- only raster-scan technology can be used in both imaging and line-drawing applications. Also, only raster-scan can provide cost-effective color rendition, particularly for the subtleties of shading necessary in imaging applications.

"The primary advantage of raster-scan is in giving users greater creative freedom than other technologies," says Doctor. "With raster-scan systems, users can generate highly arbitrary, easily manipulated graphic output -- they're not limited by colors, degrees of shading or numbers of vectors (screen lines) as they would be on non-raster systems."

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"A traditional drawback to raster-scan technology has been in image memory requirements -- compromises must be made to provide competitive pixel-storage capacity with adequate processing speed and at reasonable prices," he says. "That's why the 64K RAM is such a significant factor in new raster-scan products. And further, that's why we expect that second-generation designs like the Model One, with their reduced cost, compact electronics and lowered power consumption, will greatly accelerate the market penetration of raster-scan systems.

"Another key specification in any system is its speed in drawing lines -- the type used for LSI circuit design, for example. In the Model One, as in some other high-performance raster-scan systems, a hardware vector processor offloads line-drawing chores from the main processor," says Doctor. "But unlike other systems, the Model One employs a pixel-processing unit that is able to optimize arithmetic and logic operations performed on the image array, enabling substantially higher-speed processing of frequently used pixel functions."

Future Raster Technologies Products

Future products will evolve from the basic Model One architecture, assuring compatibility for upward systems growth. Also, Raster Technologies will work with users in specific areas to co-develop new graphics applications as new markets and uses emerge, according to Doctor.

"A key to our growth potential is in our design architecture," he says. "We'll be able to offer increasingly powerful systems based on 64K RAM memory components for the foreseeable future. Our newness gives us an advantage at this time because we're not locked in to a 16K RAM-based architecture."

Raster Technologies

One

Graphic Display Controller

Raster Technologies' Model One is a high-resolution raster-scan display controller that generates full-color images and real-time graphic output from any host computer system. For high-performance applications such as three-dimensional CAD/CAM, computer simulation or land-resource analysis, the Model One offers significant advantages over competing systems:

- Software-selectable dual-mode operation: 512 x 512 pixels for imaging; 1024 x 1024 addressable points for line drawing
- Price/performance superiority due to advanced architecture based on 64K random-access-memory (RAM) components
- Application and growth flexibility through a rich graphic-command set and upward-compatible hardware design

The Model One controller is available in a basic configuration as a tabletop enclosure, for use with an existing alphanumeric terminal and color display monitor. Depending on user requirements, additional graphic peripherals can be used with the Model One system.

User-friendly Installation, Operation

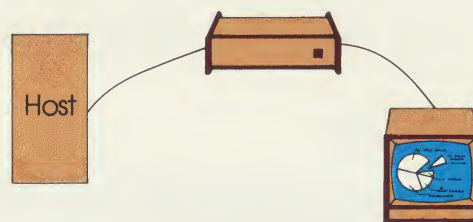
Although it employs highly advanced internal architecture, the Model One is designed to be user-friendly, from installation and operation through to new development of future applications.

Unlike most other graphic display systems, the Model One installs between the host computer and an existing alphanumeric display terminal, using standard interface cabling. To the user, sitting at a familiar keyboard, the connection adds a second-screen capability. Starting with basic graphic commands, the inexperienced user can be working productively within a day of installation.

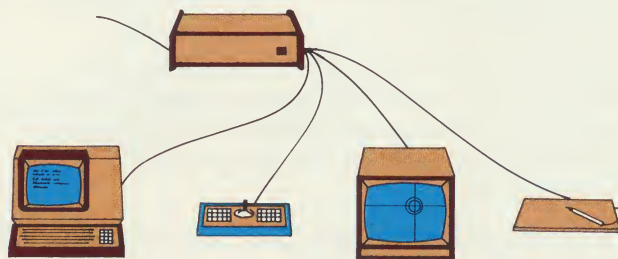


Model One

The Model One can be installed as an output-only device.



For interactive applications, additional devices can be attached.



The Model One controller is software-friendly, too. Powerful graphics commands respond to the system's application-library subroutines, which are callable from the user's own FORTRAN-based application programs. This protects against graphics-software obsolescence, and gives the user an evolutionary path into more sophisticated areas of design.

Performance Features

For high-speed imaging and real-time graphics applications the Model One maximizes the amount of information that can be presented and speeds the delivery of new data. An optional high-speed Direct Pixel Memory Access (DPMA) port can pipeline raw image data from a host processor for display. Large image memory capacity allows the Model One to offer up to 24 bits per pixel when operating in its 512 x 512 mode, and up to 6 bits per point in 1K x 1K mode.

A high-performance vector processor offloads iterative line-generation commands from the Model One central processor, with an average writing rate of better than 700,000 pixels/second. This capability makes the Model One ideal for many CAD/CAM applications that require fast line-drawing for screen updates.

Central Processor Hardware/Software

- Z8000 16-bit microprocessor with 32K bytes of RAM and 24K bytes of PROM program memory
- Three independent RS-232 serial communication ports with bandwidth to 19.2K baud
- Byte parallel bidirectional interface with bandwidth to 25 kilobytes per second
- Graphics command set with more than 50 firmware-based commands
- Support for popular interactive devices—cross-hairs, digitizer, joystick, function buttons and trackball
- Library of FORTRAN subroutines, callable from user application programs, that generate graphic commands
- Software development tools: command stream translator and Instant Replay diagnostic mode

Features include:

Graphics

- Image memory expandable to 768K bytes based on 64K RAM technology, housed on a single printed-circuit board (24 bits per pixel in 512 x 512 mode)
- Optional Direct Pixel Memory Access (DPMA) port bandwidth to 3.75 megabytes per second;
- Vector processor with 1.45 microseconds per pixel average writing rate, 1.6 microseconds per vector set-up time, and a hardware input queue that holds 240 vectors to maximize central processor utilization
- Pixel Arithmetic and Logic Unit (PALU) provides eight pixel functions including addition, subtraction, logical XOR, OR and AND operations at 400 nanoseconds per pixel
- Hardware averaging allows 1024 x 960 points to be displayed on a standard 512 x 480 pixel video monitor

Video

- Interlaced-scan, RS-170 compatible red, green, blue and sync outputs with 512 x 480 pixels displayed
- Eight-bit digital-to-analog conversion on RGB outputs
- Optional overlay plane for alphanumeric data
- Independent red, green and blue video lookup tables for intensity/color mapping
- Hardware pan and zoom (1X, 2X, 4X, 8X) functions

Specifications contained herein are subject to change without notice.

Raster Technologies

Raster Technologies, Inc., 110 Eighth Street, Troy, New York 12181 (518) 274-8031

Contact: Louis Doctor
Raster Technologies, Inc.
(518) 274-8031

FOR IMMEDIATE RELEASE
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From: Jim Buchanan
The Strayton Corporation
55 William Street
Wellesley, Mass. 02181
(617) 237-3220

NEW GRAPHICS DISPLAY SYSTEM FEATURES
DUAL-MODE IMAGE ARRAY, 64K RAM MEMORY

TROY, N.Y., August 4 -- A high-performance raster-scan graphics display system that offers software-selectable point addressability and 64K RAM-based image memory has been announced by a new company in the computer-graphics industry, Raster Technologies, Inc.

The Raster Technologies Model One graphics controller installs between an existing host computer and color display monitor. The Model One features advanced architecture, extensive graphics commands and comprehensive "user-friendly" operating aids. Also, it offers "dual mode" image-array selection -- either 512 x 512 pixels or 1K x 1K addressable points -- so users can perform both imaging and full-screen line-drawing tasks on the same display monitor. Until now, users have had to purchase separate systems for imaging and line-drawing applications.

"Because the Model One employs an advanced architecture with VLSI technology, it combines price/performance benefits that are clearly superior to competitive systems," says Louis Doctor, president and a co-founder of Raster Technologies. "These benefits, as well as the upward growth path provided by our design, are particularly important to system builders and large end users -- our initial markets for the Model One.

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"This is the industry's first raster-scan graphics system to offer dual-mode array selection, and it is the first to use 64K RAM-based architecture," says Doctor. "But it's also the first to combine these with true next-generation user-responsiveness, by providing installation and operation ease, as well as application and growth capabilities that are hard to match with current-generation products."

Performance, Flexibility for Multiple Applications

For applications in computer imaging the Model One features high resolution in a 512 x 512 pixel array. The unit's image memory, expandable to 768K bytes, utilizes 64K RAMs and is contained on a single printed circuit board. This gives the Model One up to 24 bits of information storage for each pixel on the screen.

For line-drawing and other graphics applications where less per-pixel storage is needed, the Model One uses hardware pixel-averaging to give users up to six bits of storage for each of 1024 x 1024 points.

"Some other '512' systems can display a partial view, or window into a '1K' image array, but they can't display the full-screen 1K x 1K array," says Doctor. "The Model One is unique because it gives a window or an entire full-screen '1K' display, on a standard video monitor.

"This means that for the first time users can switch -- via software commands -- from imaging to line drawing applications without having to change systems or display monitors," says Doctor. "This can save thousands of dollars for some users, and it can open up new application possibilities for others."

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Other performance features include a 16-bit Z8000 central processor; a high-speed hardware vector processor that offloads iterative line-generation commands from the Model One processor; an optional Direct Pixel Memory Access (DPMA) port with bandwidth up to 3.75 megabytes per second; and an optional overlay plane for alphanumeric data. The Model One also provides hardware pan and zoom (1X, 2X, 4X, 8X) functions, and supports popular interactive graphic devices such as crosshairs, digitizer, joystick, function buttons and trackball.

User-Friendly Installation and Operation

The Model One graphics display system offers a rich command set with high-level software interfaces to user application programs in FORTRAN. Because the Model One can connect to the user's alphanumeric terminal and can respond to calls from the user's application programs, user training is simplified, according to Doctor.

"A user can begin with basic functions, working from a familiar terminal and with existing application programs, and do productive work the first day of installation," he says. "As experience develops, the user can move to more sophisticated types of graphics functions.

"And as new applications evolve, the user will find some unique software development and diagnostic aids in the Model One," says Doctor. "These include a command-stream translator for debugging that can tell the user exactly what commands are being transmitted from the host processor to the Model One graphics controller. Another aid is what we call 'instant replay' -- it's a diagnostic mode for analyzing commands that were executed erroneously."

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Price and Availability

Basic configuration of the Model One system is a tabletop controller, which can connect to an existing system as an interactive or output-only device. The Model One controller supports (and can be shipped with) popular display monitors and other graphics peripherals.

Single-unit price for the Model One controller starts at \$10,800. Substantial OEM discounts are available. Raster Technologies will begin shipping evaluation units in October; beginning in January Model One units will be available in 60 days ARO.

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